

REMARKS

This amendment is in response to the Official Action mailed on October 18, 2006, the statutory period for responding with a three-month extension of time being set to expire on April 18, 2006. Claims 1-2, 5-8, and 12-18 are currently pending in the application.

I. CLAIM AMENDMENTS

Applicant has added new claims 17-19. Applicants contend that there is support in the specification for these claim amendments and that no new matter has been added. See Original Application, Paragraphs 35 and 40.

II. 35 U.S.C. § 102 REJECTION

The Examiner has maintained his rejection of claims 1-2, 4 and 8 under 35 U.S.C. § 102, in view of U.S. Patent No. 4,599,116 to King ("King"). The Examiner contends that all of the limitations are currently taught by King. For the following reasons, Applicants respectfully disagree with the Examiner's assertions.

The claimed invention teaches the addition of a neutralizing chemical liquid to neutralize the cleaning chemical liquid during the continuous feeding of the pure water. Due to the use of pure water, the purity of pure water indicated by resistivity thereof does not deteriorate throughout the rinsing process, as shown in Fig. 2. Accordingly, the claimed method permits the cleaning chemical of the chemical liquid adhered to the cleaned object to be substantially fully removed, preferably in one stage, although this is not required. Such a method

further permits a substantial reduction in the quantity of pure water required for rinsing.

A. King Fails To Teach the Neutralization of the Cleaning Chemical Liquid

In contrast to Applicants' claimed invention, King teaches the neutralization of the rinse water. King states that the rinse solution is progressively contaminated by remnants of the alkaline cleaning solution carried over by the cleaned containers. In order to avoid alkalinity in the subsequent rinse stages, the pH of the rinse solution must be maintained at about a pH of 7.5 or below. Maintaining the rinse solutions at this pH level substantially eliminates the formation of brown stains on the aluminum container bodies that is generally caused by rinsing with alkaline rinse water. See Col.7, 11.17-37. King therefore focuses on the neutralization of the rinse water, and not the neutralization of the cleaning chemical liquid, such as in Applicants' claimed invention. Accordingly, Applicants respectfully contend that King fails to teach this limitation.

B. King Fails To Teach The Use Of Pure Water

Furthermore, Applicants' claimed invention requires the use of pure water. As a result, the purity of pure water is maintained throughout the rinsing process.

In contrast, King does not teach the use of pure water. This is evident as King states that the rinse solution is progressively contaminated by remnants of the alkaline cleaning

solution carried by the cleaned containers. Col.5, 11.23-26. Consequently, Applicants respectfully assert that King also fails to teach this limitation.

C. King Fails To Teach "The Rinsing Process Being Conducted Using A Single Immersion Step"

Applicants' claimed invention also requires "the rinsing process being conducted using a single immersion step." Such a process is possible due to the use of pure water, as well as the method steps set forth herein.

In contrast, King does not teach or suggest that it is possible to complete the process in one step. Indeed, King teaches maintaining the rinse water at a pH level of about 7.5 or up to an acidic level. See Col.7, 11.31-33. By maintaining the rinse water at such pH levels likely requires the cleaned containers to be subjected to multiple rinsing stages, thereby requiring greater amounts of rinse water and more than one immersion step. Thus, Applicants respectfully contend that King does not teach or suggest this limitation.

D. King Fails to Teach The Formation of a Salt

Finally, the Examiner contends that because King teaches all of the method steps of Applicants' claim invention, King inherently teaches the production of salt.

As described above, Applicants contend that King does not teach all the steps of the claimed invention. Accordingly,

Applicants contend that King does not teach or suggest the production of a salt.

For the reasons set forth above, Applicants contend that the Examiner's rejections of claims 1-2, 4 and 8 are overcome. Consequently, Applicants contend that for these reasons, and the reasons set forth below, claims 1-2, 4 and 8 are in condition for allowance.

III. 35 U.S.C. § 103 REJECTION

The Examiner has rejected claims 1-2, 5-8, 12, and 15-16 under 35 U.S.C. § 103, in view of U.S. Patent No. 5,656,097 to Olesen ("Olesen"). The Examiner contends that Olesen teaches all of the limitations of the pending claims, except for the formation of a salt. For the reasons stated below, Applicants contend that Olesen fails to teach or suggest several of the limitations of Applicants' claimed invention.

A. Olesen Fails To Teach "Neutralizing The Chemical Liquid With The Neutralizing Chemical Liquid"

The claimed invention requires the addition of a neutralizing chemical liquid opposite to that of the cleaning chemical liquid to produce a salt by "neutralizing the chemical liquid with the neutralizing chemical liquid."

In contrast, Olesen does not teach neutralizing the chemical liquid used to clean the wafer with a corresponding neutralizing chemical liquid.

Olesen teaches cleaning wafers in various cycles, including Vc1 and Vc2. In the Vc1 cycle, chemical additives are used to clean the wafer and megasonic energy is applied to the interior of the tank. The purpose of applying megasonic energy is to loosen particles on the wafer. "By utilizing the

megasonic system, with standard cleaning solutions, films and adsorbed contaminants are removed at the same time that particles are being removed by the megasonic energy." See Col.2 11.25-40.

In the Vc2 cycle, HF or BOE is injected into cold DI water to remove native oxides from a wafer, and not to neutralize the chemical liquid that is used to clean the wafer. As stated in Col.11, 11.32-35, "[t]he Vc2 cycle solution acts to strip the oxide from the wafers, removing metals which are less electro-negative than silicon." In this regard, the solution is not used to neutralize the cleaning chemical liquid, but rather to remove oxides on the wafers. Thus, Applicants respectfully contend that Olesen does not teach or suggest this limitation.

B. Olesen Fails To Teach "Adding A Neutralizing Chemical Liquid...During The Continuous Feeding Of The Pure Water"

The claimed invention requires the addition of the neutralizing chemical liquid "during the continuous feeding of the pure water to the rinse bath."

In contrast to the claimed requirement of performing the steps of adding the neutralizing chemical liquid *during* the feeding of the pure water to the rinse bath, Olesen teaches separately performing these steps. Specifically, Olesen teaches that at the end of the etch period (i.e., after the addition of HF or BOE), "the HF injector is turned off and high flow DI water rinse is *begun*." See Col.11, 11.52-56 (emphasis added). In other words, Olesen teaches adding the HF, turning off the supply of HF, and then feeding the DI water rinse into the tank. It does not teach adding the HF during the feeding of the DI water rinse. Thus, Applicants respectfully contend that Olesen does not teach or suggest this limitation.

C. Olesen Fails To Teach "Continuously Feeding Pure Water To The Rinse Bath So As To Rinse Off The Cleaning Chemical Liquid"

The claimed invention requires "continuously feeding pure water to the rinse bath so as to rinse off the cleaning chemical liquid."

In contrast, Olesen teaches a series of rinsing and dumping steps to disperse the cleaning chemical liquid. Specifically, Olesen teaches that after cleaning chemicals are added to the tank, "the tank is then quickly emptied and cool DI is sprayed onto the wafers and the interior sides of the tank." Col.4, 11.2-8. Thereafter, once the water levels reach a certain level, "the cold DI flow is terminated and the tank is once more dumped. The cold DI spray is interrupted near the end of the cold DI flow..." Col.4, 11.14-16. Thus, Applicants respectfully contend that Olesen fails to teach or suggest the aforementioned claimed limitation.

D. Olesen Does Not Teach The "Rinsing Process Being Conducted Using A Single Immersion Step"

Applicants' invention teaches the rinsing process being conducted using a single immersion step. As discussed above in section III.C, the Olesen method teaches a series of rinse and dump steps to clean the wafer. As such, Olesen does not teach a rinsing process conducted in one immersion step.

For the reasons set forth above, Applicants respectfully contend that the Examiner's rejections of claims 1-2, 5-8, 12, and 15-16 are overcome. Applicants therefore respectfully assert that these claims are also in condition for allowance.

IV. CONCLUSION

As it is believed that all of the rejections set forth in the Official Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that he telephone Applicants' attorney at (908) 654-5000 in order to overcome any additional objections which he might have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

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Respectfully submitted,

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